

Ames Air Revitalization

Presented to the Bioastro Seminar

CU Boulder

Dec. 9, 2015

Topics

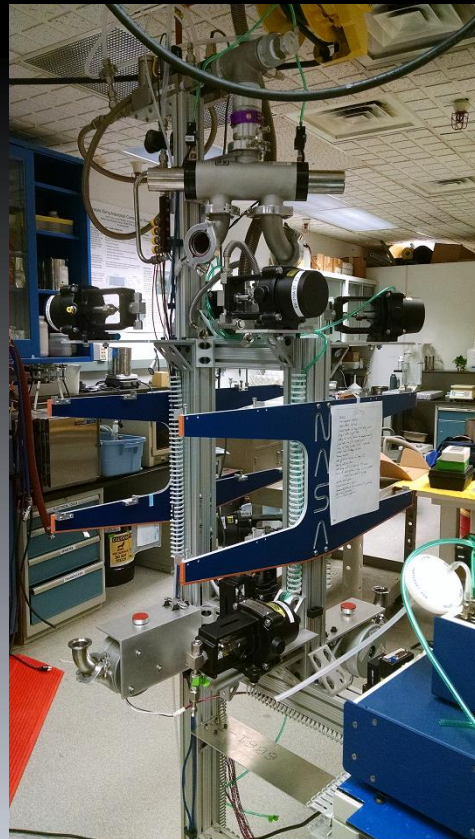
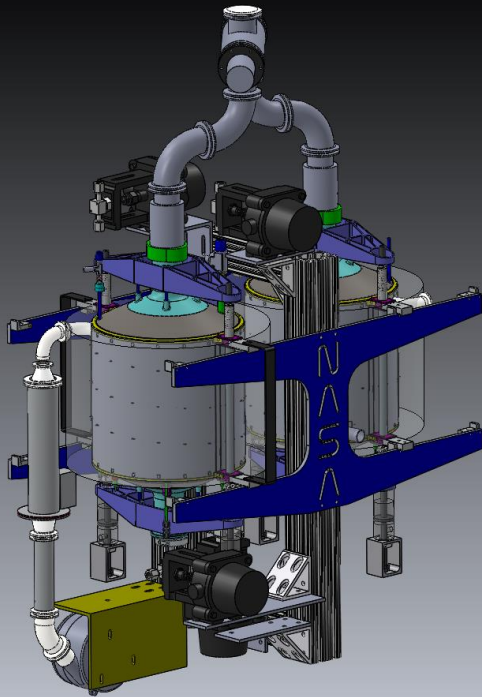
- Carbon Dioxide Removal and Compression System (CRCS)
- CDRA 4 Silica Gel bed testing
- Adsorption research

CRCS

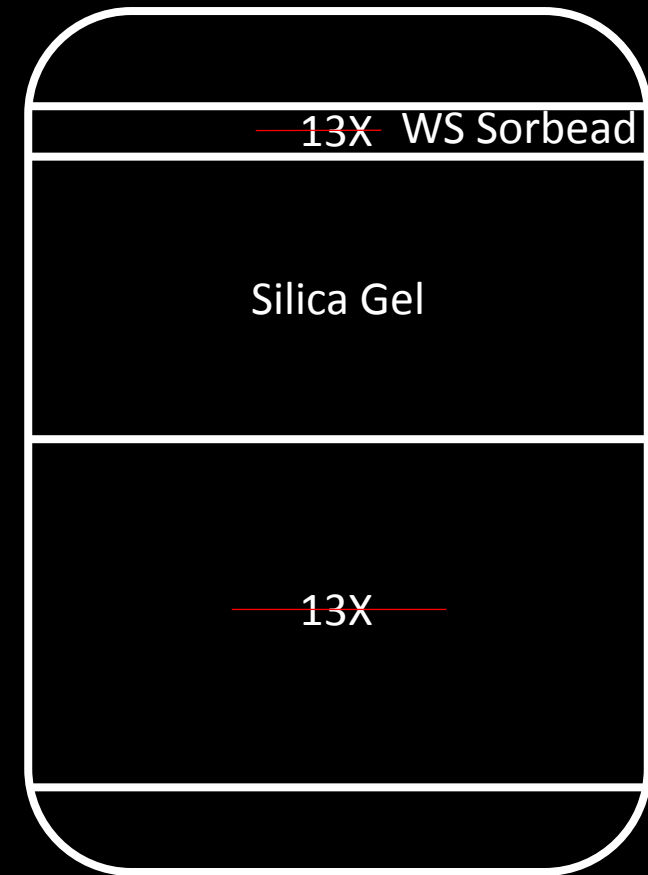
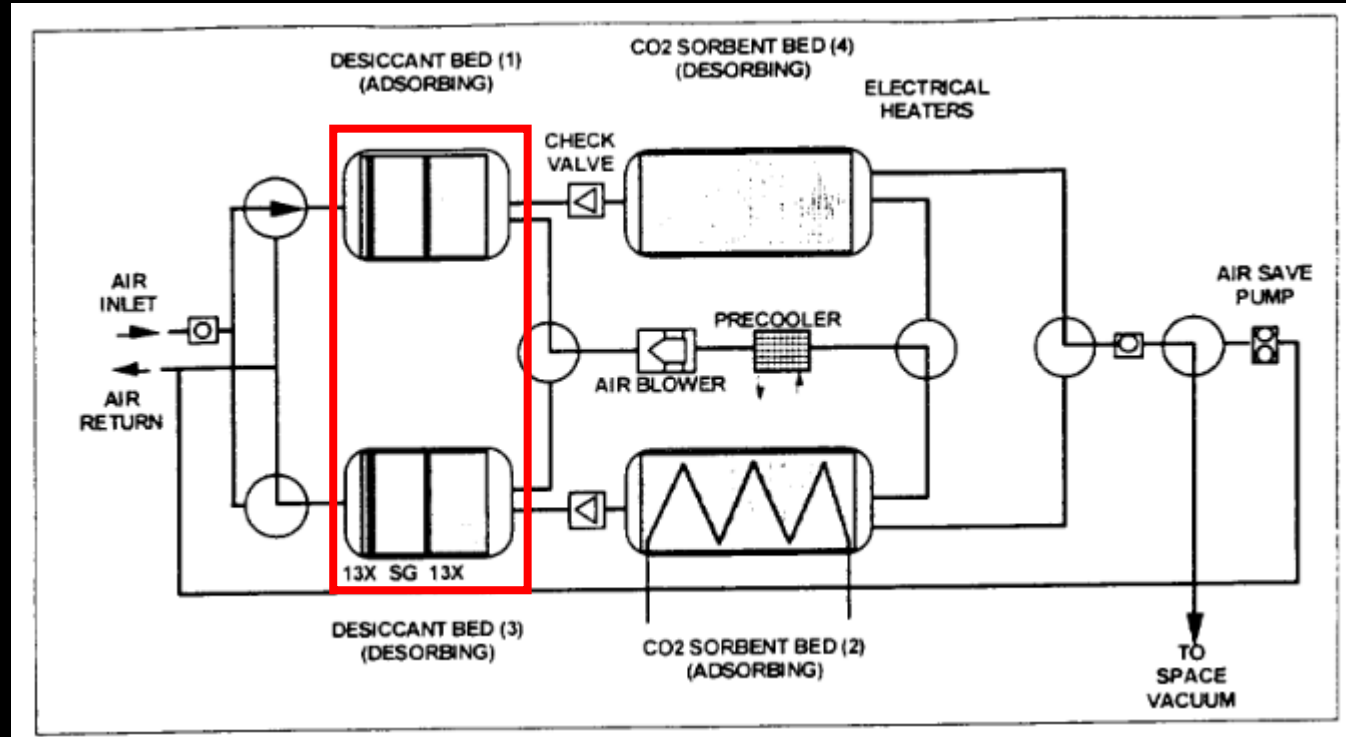
- Competitive technology to CDRA-Compressor system for CO₂ recovery and compression from cabin air
- Problems with CDRA
 - Zeolite dusting causing valve and compressor clogging/failure
- Problems addressed with CRCS
 - Built-in compression

CRCS

- Final assembly of A and B units
- Bed packing and assembly of A unit for half system testing
- Full system integration



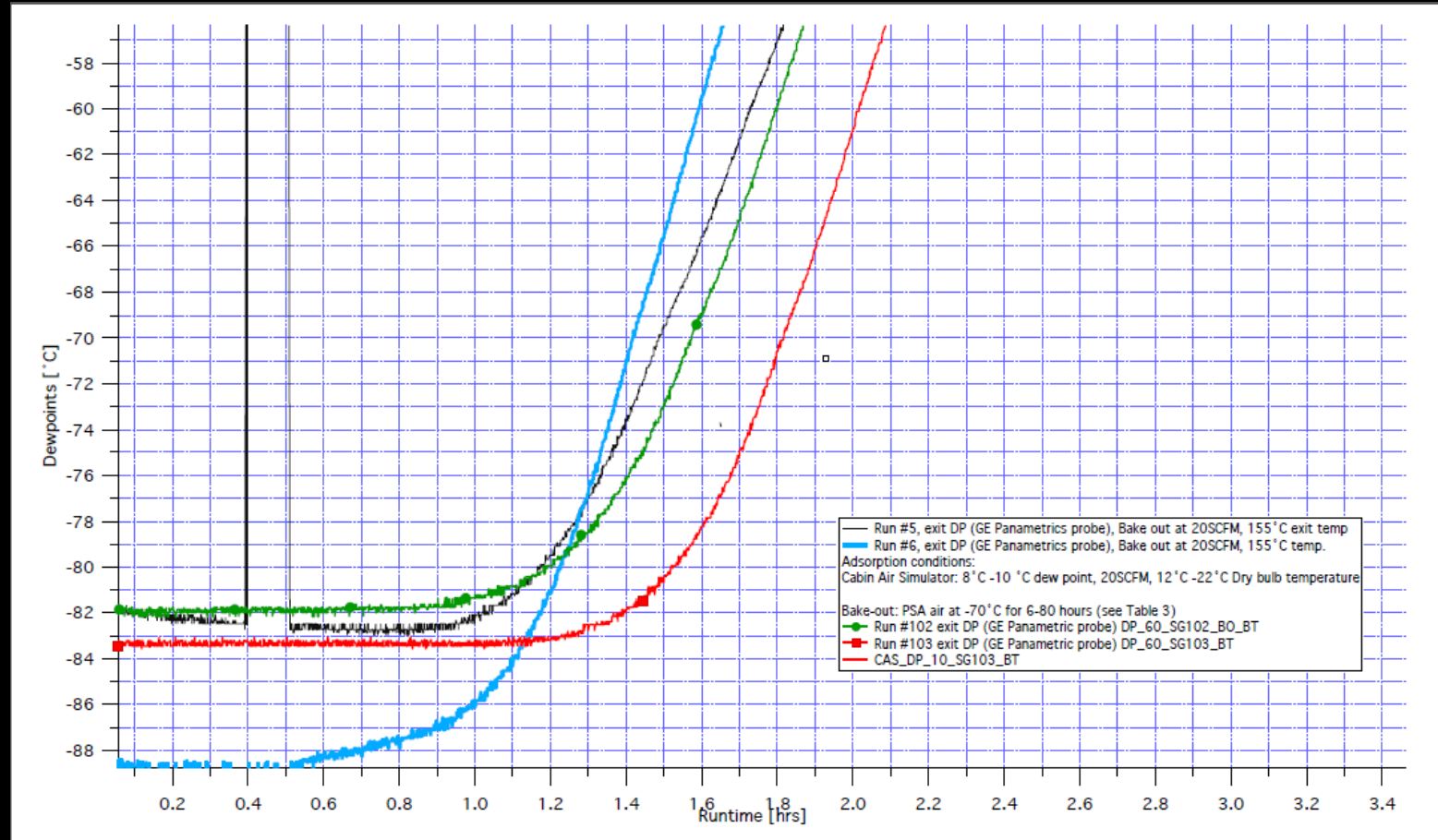
Silica Gel Drying Bed



Knox, James. "International Space Station Carbon Dioxide Removal Assembly Testing". SAE Technical Paper Series, 30th International Conference for Environmental Systems, July 2000, Toulouse, France.

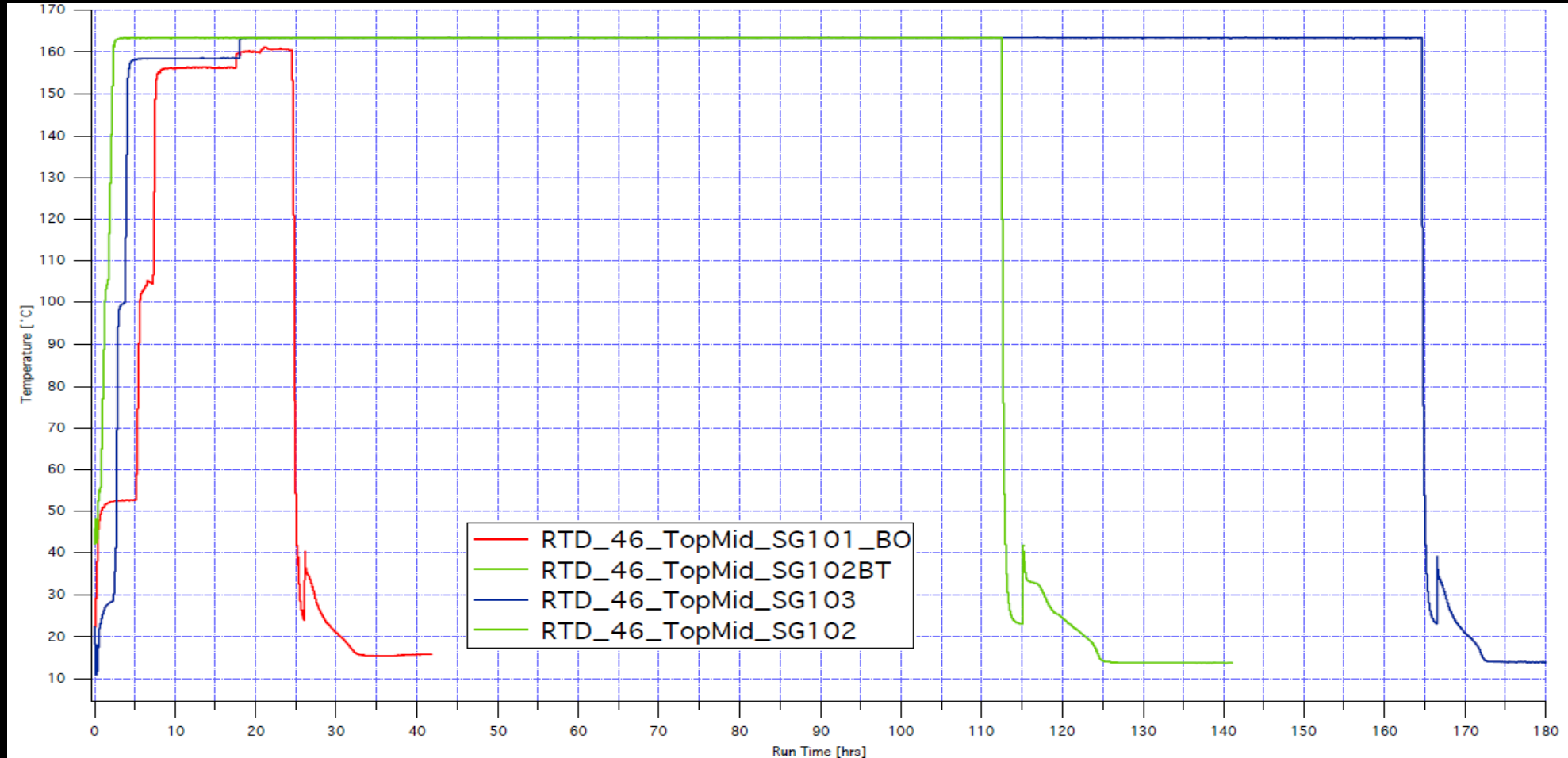
Silica Gel Drying Bed

H2O Breakthrough Curves



Silica Gel Drying Bed

Breakthrough Bed RTD Temperature

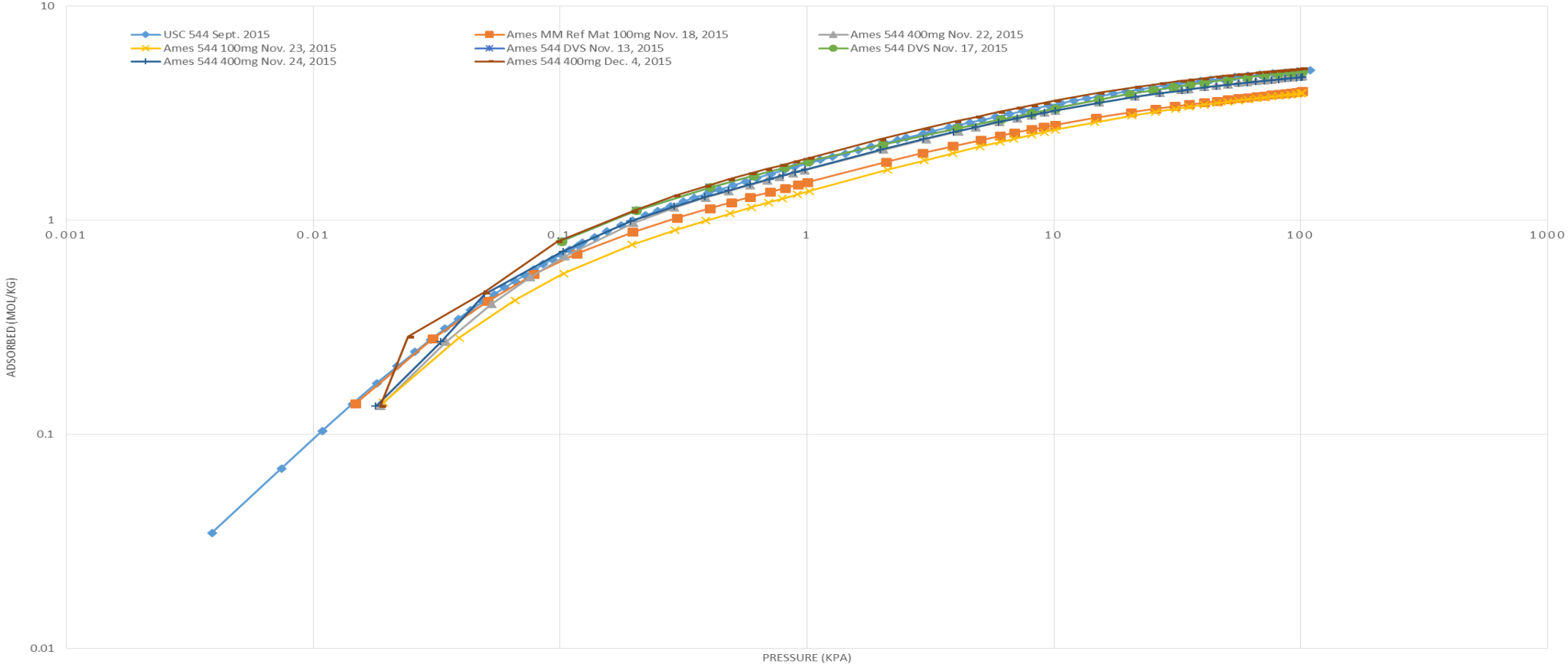


Adsorption Research

- Evaluate sorption materials for CO₂ and H₂O adsorption under varying conditions
- Generate isotherm curves and compare/feed data to MSFC for simulations
- New toys
 - Micromeritics ASAP 2020 volumetric adsorption analysis system
 - Surface Measurement Systems DVS Vacuum gravimetric adsorption analysis system

Adsorption Research

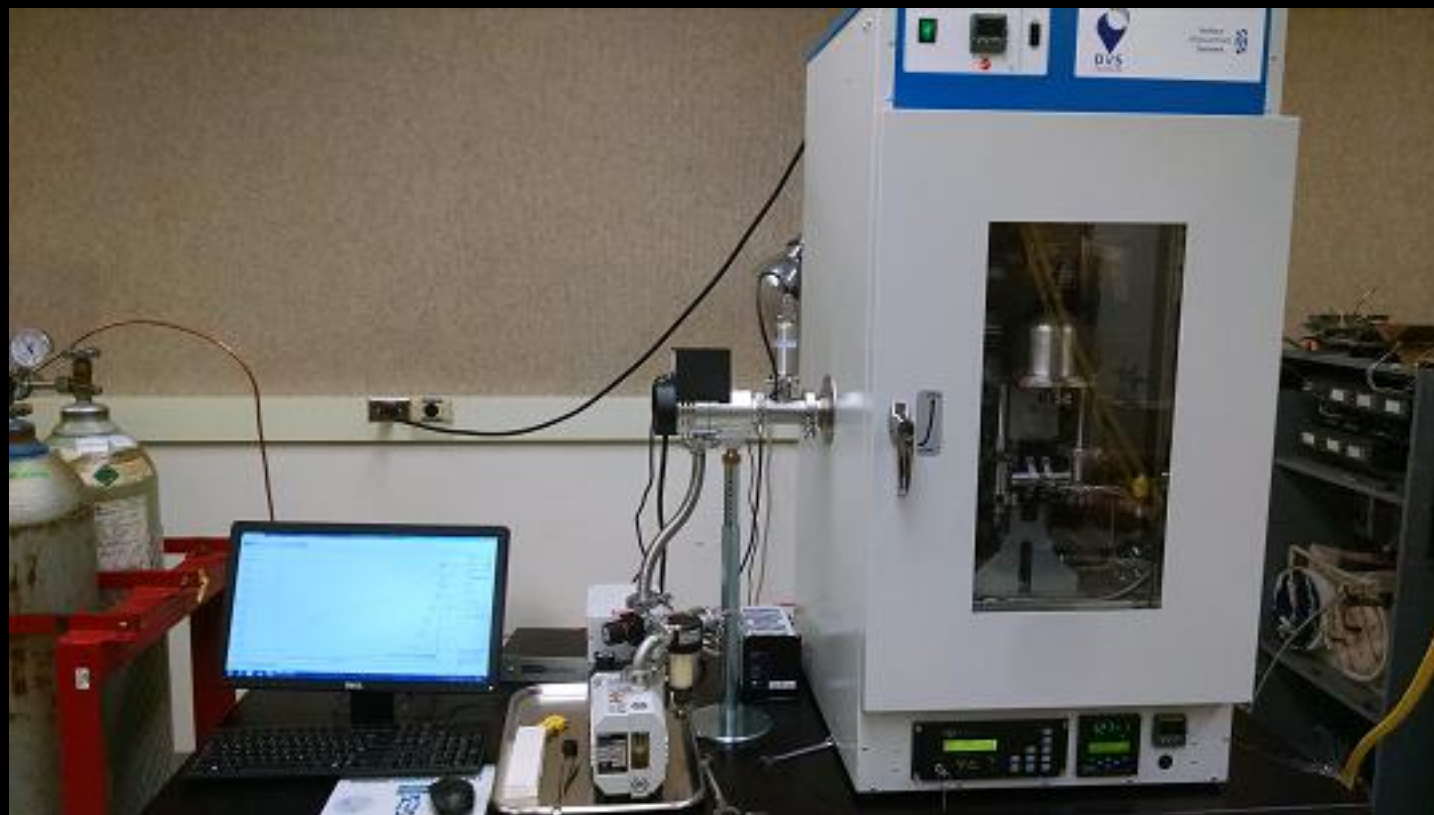
13X ISOTHERMS AT 25C



Adsorption Research



ASAP 2020



DVS Vacuum

Questions?

The Carbon Dioxide Removal and Compression System (CRCS) Full Cycle

